

WHAT IS CLAIMED IS:

1 1. A device for ablating tissue in the living body comprising:
2 an elongate member defining a longitudinal passage having a distal opening and a
3 proximal opening dimensioned to pass a guide element, the elongate member including an
4 electrode disposed at a distal portion of the elongate member and configured to be energized
5 with high frequency energy to ablate tissue.

1 2. The device of claim 1 wherein the elongate member comprises a blunt distal tip.

1 3. The device of claim 1 wherein:
2 the device further comprises a fluid inlet port and a fluid outlet port; and
3 the elongate member further defines a fluid channel in fluid communication with the
4 fluid inlet port and the fluid outlet port and in thermal communication with the electrode.

1 4. The device of claim 2 wherein:
2 the elongate member is rigid; and
3 the blunt distal tip converges smoothly with the distal opening.

1 5. The device of claim 4 wherein:
2 the blunt distal tip comprises a rounded contour surrounding the distal opening.

1 6. The device of claim 4 wherein the blunt distal tip comprises a tapered contour
2 converging with the distal opening.

1 7. The device of claim 1 wherein the elongate member is flexible.

1 8. The device of claim 7 wherein the electrode includes a tapered contour converging
2 with the distal opening.

1 9. The device of claim 2 wherein the elongate member is flexible.

1 10. The device of claim 9 wherein the electrode is a ring.

11. A device for ablating tissue comprising:

a rigid elongate tubular member defining a longitudinally extending lumen having a distal opening and a proximal opening, the lumen dimensioned to pass along a guide element, a distal portion of the tubular member having a blunt distal tip;

an electrode disposed at a distal portion of the tubular member and configured to be energized with high frequency energy to thermally ablate tissue; and

a fluid channel defined within the tubular member, the fluid channel in fluid communication with the fluid input port and the fluid output port and in thermal communication with the electrode.

12. The device of claim 11 wherein:

the tubular member comprises:

a metal tube having an external surface; and

an electrical insulator configured to electrically insulate a portion of the external surface of the metal tube;

the electrode comprises:

an exposed portion of the external surface of the outer metal tube;

the device further comprises:

an inner metal tube disposed within the metal tube and defining a portion of the lumen;

the blunt distal tip comprises

a fluid sealed junction between the metal tube and the inner metal tube; and

the fluid channel being located at least in part between the metal tube and the inner metal tube.

13. The device of claim 11, wherein:

the tubular member comprises a plastic tube; and

the electrode comprises a metal element.

14. A device for ablating tissue comprising:

a flexible elongate tubular member defining a longitudinally extending lumen having

2009-07-01 14:00:00

3 a distal opening and a proximal opening, the lumen dimensioned to pass along a guide
4 element, a distal portion of the tubular member having a blunt distal tip;
5 an electrode disposed at a distal portion of the tubular member and configured to be
6 energized with high frequency energy to thermally ablate tissue; and
7 a fluid channel defined within the tubular member, the fluid channel in fluid
8 communication with the fluid input port and the fluid output port and in thermal
9 communication with the electrode.

1 15. The device of claim 14 wherein the electrode includes a tapered contour
2 converging with the distal opening.

1 16. The device of claim 14 wherein the electrode is a ring.

1 17. A system for ablation of a tissue in the living body comprising:
2 a guide element; and
3 an ablation system including:
4 an elongate member defining a longitudinal channel having a distal opening
5 and proximal opening, the elongate member being dimensioned to slide along the guide
6 element; and
7 an electrode at a distal portion of the elongate member and configured to be
8 energized with high frequency energy to ablate the tissue.

1 18. The system of claim 17 further comprising a needle element defining a
2 longitudinal lumen dimensioned to pass the guide element, wherein the needle includes a
3 sharp distal tip configured to perforate the tissue.

1 19. The system of claim 17 wherein the guide element comprises a flexible guide
2 wire.

1 20. The system of claim 17 wherein the guide element comprises a rigid stylet wire.

1 21. The system of claim 17 wherein the guide element comprises an anchor that
2 extends laterally from a distal guide portion of the guide element, the anchor configured to
3 anchor the distal guide portion near a target.

1 22. The system of claim 17 wherein the guide element comprises a tube containing a
2 movable member.

1 23. The system of claim 22 wherein the movable member is a tube.

1 24. The system of claim 22 wherein the movable member is an anchor.

1 25. The system of claim 17 wherein the ablation system further comprises:
2 a high frequency generator; and
3 electrical conductors connecting the high frequency generator to the electrode.

1 26. The system of claim 17 wherein:
2 the elongate member defines a fluid channel in fluid communication with a
3 fluid input and a fluid outlet and in thermal communication with the electrode; and
4 the ablation system further comprises a coolant supply connected to the fluid
5 input.

1 27. The system of claim 17 wherein the ablation system further comprises a fluid
2 agent injector.

1 28. A method for thermal ablation of a target volume, comprising:
2 perforating and penetrating a living body using a guide element to establish a
3 tract through the body to the target volume;
4 sliding an electrode along the guide element to position the electrode near the
5 target volume, the electrode including an elongate member defining a longitudinal passage
6 dimensioned to pass along the guide wire, a conductive surface at a distal portion of the
7 elongate member, and an electrical connection between the conductive surface and a
8 proximal portion of the elongate member;

9 connecting the electrical connection to a high frequency generator; and
10 supplying high frequency energy from the generator through the electrode to
11 the target volume to thermally ablate the target volume.

1 29. The method of claim 28 further comprising cooling the electrode while supplying
2 high frequency energy to change a spatial distribution of heat near the electrode, cooling
3 including connecting a source of a coolant to a fluid input and causing a coolant to flow in a
4 fluid channel in the elongate member, the fluid channel being in fluid communication with
5 the fluid input and a fluid output and in thermal communication with the electrode.

1 30. The method of claim 28 wherein:
2 perforating and penetrating comprises passing a sharp needle through skin and
3 tissue; and
4 positioning comprises passing the guide wire through the needle and removing
5 the needle over the guide wire to leave the guide wire in the tract.

1 31. The method of claim 28 wherein positioning comprises deploying an anchor from
2 the guide wire to anchor the guide wire in the tract.

1 32. The method of claim 28 further including dilating the tissue along the tract after
2 positioning the guide wire by passing a dilating element over the guide wire to expand the
3 tissue along the tract prior to sliding the electrode along the guide wire.

1 33. The method of claim 28 further comprising introducing a fluid agent through the
2 guide element.

1 34. The method of claim 28 further comprising introducing a chemotherapeutic agent
2 through the guide element prior to or while supplying high frequency energy.